Performance Management
Action Item 1: Recovery Targets for Eelgrass
For February 17, 2010 Leadership Council meeting

Prepared by: Scott Redman

Presented by: Scott Redman and partner staff from the Department of Natural Resources

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Proposed Action: Adopt Resolution 2011-01 - ecosystem recovery targets for eelgrass (Attachment 1)

Summary: An important function of the Puget Sound Partnership is to develop targets for ecosystem recovery to guide and allow evaluation of recovery activities. Setting targets is a key step in the Partnership's role of holding the system accountable for progress toward recovery. Two topics for target setting have advanced to the point that the Leadership Council could adopt ecosystem recovery targets: eelgrass and shellfish beds restored.

Background: The Ecosystem Coordination Board discussed target setting for eelgrass and shellfish beds restored on February 3, 2011. Attachment 2, prepared by staff, describes options for eelgrass target setting as articulated in the Board's February 3 discussion. Attachment 3 is the brief sheet developed as background information by the Indicator Champion for eelgrass. These brief sheets were provided to the Ecosystem Coordination Board in advance of its February 3 discussion.

Analysis: Per RCW 90.71.310(1)(c), "The action agenda shall include near-term and long-term benchmarks designed to ensure continuous progress needed to reach the goals, objectives, and designated outcomes by 2020." Per RCW 90.71.280(3), "the [leadership] council shall confer with the [science] panel on incorporating … benchmarks into the action agenda."

The Partnership has applied the term "targets" to refer to long-term benchmarks designed to ensure progress to designated outcomes by 2020. Additional information about the Partnership's principles and processes for target setting in 2011 is described in a separate packet of materials for the February 17, 2011 Leadership Council meeting.

Staff Recommendation: Staff recommends that the Leadership Council pass resolution 2011-01, as outlined in Attachment 1, to adopt a recovery target for eelgrass.

Next Steps:

1. Staff will share the adopted targets, and information about the target setting process, to help guide development of background information for other targets.
2. Staff will share the adopted targets with scientists developing an ecosystem-perspective view of dependencies, tradeoffs, and other relationships among Partnership targets.

Attachments:

- Attachment 1 – Resolution 2011-01: adopting an ecosystem recovery target for eelgrass
- Attachment 2 – Options for ecosystem recovery targets: eelgrass
- Attachment 3 – Brief sheet on setting targets for Dashboard indicators: eelgrass

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Leadership Council Resolution 2011-01
Adopting an ecosystem recovery target for eelgrass

WHEREAS, RCW 90.71.310(1)(c) states that "The action agenda shall include near-term and long-term benchmarks designed to ensure continuous progress needed to reach the goals, objectives, and designated outcomes by 2020;" and

WHEREAS, RCW 90.71.280(3), "the [leadership] council shall confer with the [science] panel on incorporating … benchmarks into the action agenda;" and

WHEREAS, the Partnership has applied the term "targets" to refer to long-term benchmarks designed to ensure progress to designated outcomes by 2020; and

WHEREAS, the science-policy workshop convened as part of the Science Panel meeting on December 14, 2010 recommended that the Partnership adopt ecosystem recovery targets to address the full breadth of the Partnership's interests in a recovered ecosystem as part of the 2011 revisions to the action agenda; and

WHEREAS, fringing beds and meadows of eelgrass (*Zostera marina*) provide important habitat functions and services, and eelgrass has been adopted as one of the Partnership's Dashboard indicators of ecosystem condition; and

WHEREAS, technical experts from the Department of Natural Resources have presented analyses to the Partnership about potential ecosystem recovery targets for eelgrass; and

WHEREAS, the Ecosystem Coordination Board has discussed potential ecosystem recovery targets for eelgrass, based on the background information presented in advance of their February 3, 2011 meeting; and

WHEREAS, the above processes provide sufficient background for adoption of ecosystem recovery targets consistent with the Partnership's guiding principles for target setting

NOW, THEREFORE BE IT RESOLVED, that

The Partnership's ecosystem recovery target for eelgrass shall be expressed as:

[selected from among the available options or another version as decided by the Council]

BE IT FURTHER RESOLVED, that

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Reevaluation of this target will be triggered at the direction of the Partnership's science panel based on their evaluation of improved scientific information about ecosystem conditions and pressures.

Resolution Moved By: _____

Resolution Seconded By: _____

Approved/Denied/Deferred (underline one)

DATE: _____

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Attachment 2 – Options for Ecosystem Recovery Targets: Eelgrass[1]

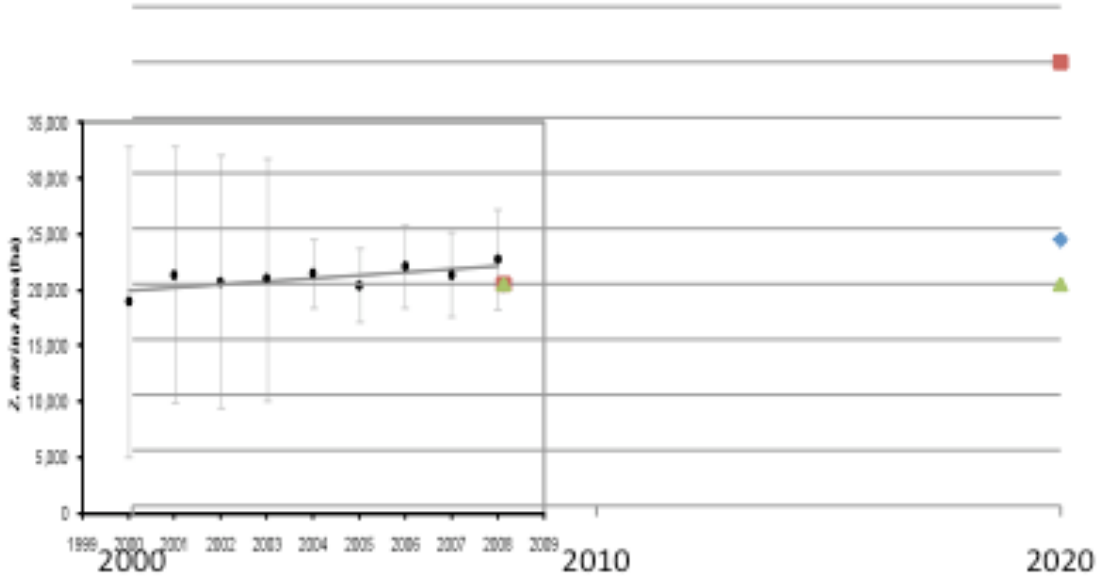
	Option A	Option B	Option C
Objective	Eelgrass extent remains stable through 2020 relative to area measured in 2000-2008 baseline period	Eelgrass extent in 2020 is 120 percent of area measured in the 2000-2008 baseline period	Eelgrass extent in 2020 is 200 percent of area measured in the 2000-2008 baseline period
Statements in support	Minority perspective from 2/3/2011 ECB discussion	Dept. of Natural Resources recommendation Generally supported by 2/3/2011 ECB discussion	
What level of recovery effort is implied by this target?	Since eelgrass extent appears steady in recent years, continued effort (e.g., to protect shoreline processes and/or control sources of water pollution) would be needed to extend stable eelgrass in the face of increasing pressures related to growing human population	Additional effort (e.g., to protect shoreline processes and/or control sources of water pollution) needed to increase from steady eelgrass extent observed in recent years. "Aggressive restoration" has achieved this rate of improvement in other systems.	Substantially increased effort implied: extensive restoration of nearshore processes and/or control of sources of water pollution. Reflects a rate of improvement beyond that reported in other systems.
What level of ecosystem function, service, or resilience is implied by this target?	Maintains current functions and services	20% increased area assumed to provide modest increase over current ecosystem functions and services to address past declines	Doubling of eelgrass area (to equal some estimates of historical levels) assumed to provide approximate doubling of ecosystem functions and services

Stakeholder discussion points:

- Eelgrass critiqued as indicator because we have limited understanding about eelgrass response to management
- Eelgrass critiqued as indicator because it varies significantly from year to year.

[1] Refers to total areal extent of *Zostera marina* in Puget Sound

Eelgrass baseline and options for targets



Puget Sound Partnership – Setting Targets for Dashboard Indicators

Indicator: Eelgrass

Authors: Pete Dowty, Helen Berry, Jeff Gaeckle, DNR Aquatic Resources Division
Version: 25Jan2011

1. What is the current and historical condition of eelgrass in Puget Sound?

The available information suggests that there have been significant eelgrass losses relative to historical conditions and losses are continuing today. This is based on the global pattern of seagrass decline, the extensive alteration of the Puget Sound nearshore (overwater structures, dredging & filling), and the evidence of decline in the contemporary monitoring record. The overall magnitude of change since historical conditions has not been quantified.

2. What is considered a good condition for Puget Sound eelgrass as a whole?

Two broad options were considered for defining good condition for eelgrass: stable or increasing total eelgrass area. Given the likelihood of past eelgrass declines, an increasing trend is needed for Puget Sound restoration. A stable trend would protect from future losses but would not address past declines. Question 6 further discusses more specific point targets for consideration as targets for performance management.

3. Hypothesized impacts of low and high population and climate change scenarios on eelgrass

In the long-term, climate change is anticipated to lead to greater stress on eelgrass followed by decline. In some specific cases, there are likely to be initial benefits from climate change and declines may not be observed for more than 100 years, although it is not known how extensive these cases will be. Hardened shorelines will be particularly problematic for eelgrass as sea-level rises. Population growth is likely to increase stressors on eelgrass, but there is a greater potential for mitigation of these effects than for those of climate change.

4. Initial conceptual model: What affects this ecosystem component

There are many documented stressors that affect eelgrass. They fall into two broad categories: (1) Stressors that affect basic physiological requirements of eelgrass (e.g., light, temperature, oxygen, nutrients, sediment); (2) Activities in the nearshore that create direct physical stress to the plants (e.g., dredging, filling, propeller wash, boat wakes, in-water construction). Eelgrass provides key ecosystem services to a wide range of species.

5. Based on scientific understanding, how much eelgrass is needed for a functioning, resilient ecosystem?

We suggest three broad alternatives for consideration as provisional point targets for total eelgrass area for performance management:

- 20% increase over 10 years - This target reflects the average percentage increase seen in other estuaries in the United States that have established aggressive restoration programs. It is the preferred alternative because it most fully considers the Partnership's restoration goals, restoration results in other regions, and gaps in scientific knowledge in Puget Sound.
- Stable – This target strives to protect current habitat against future stressors, which are likely to increase. However, it is inconsistent with the Partnership's mandate to recover Puget Sound in the face of past declines.
- 100% or greater increase. This scale of increase would be needed for eelgrass area to equal published sources to historical levels. However, these published sources are based on flawed

information, and therefore a 20% increase over 10 years is the strongest alternative (see also question 2).

6. Restoration potential/opportunity, including geographic/spatial information; or other projections

Restoration of eelgrass in Puget Sound, primarily conducted as compensatory mitigation, has proven to be challenging. Successful projects have demonstrated that there is potential for restoration and habitat creation. Restoration of nearshore processes may also lead indirectly to eelgrass restoration, for example, as anticipated with the Elwha River dam removal.

7. Considerations related to policy

a. Aspects of geographic distribution that might affect policy setting

The sub-basins within greater Puget Sound are ecologically distinct in terms of eelgrass bed characteristics, the functions they provide, and the combination of stressors that are likely to be most important. Initially, only a single soundwide eelgrass target will be ready for consideration. Given these unique considerations, indicator setting and tracking would be most effectively applied at the sub-basin scale.

b. Timeframes and sequencing related to anticipated results

To reach the goals, it will be important to pursue both protection of existing beds and restoration of impacted areas. Protection of existing beds and the habitat conditions is critical to preventing further losses, and can be achieved through first fully enforcing existing regulations and second addressing gaps in protections. Timeframes and sequencing related to restoration actions depend on the nature of the opportunity. Short term opportunities (for rapid restoration success) are limited primarily to areas where eelgrass propagules are needed to establish beds or habitat conditions can be improved rapidly (such as removal of structures that block light). Projects that improve habitat conditions through water quality improvement or nearshore process restoration generally require long time frames, both for project implementation and subsequent bed establishment. Stakeholder motivation and interest will have the greatest influence on development and implementation of eelgrass restoration over specified timeframes.

c. Conceptual model part 2: information on strategies and actions (and implementers) expected to have the most direct and timely effect on changing the conditions/achieving the targets

Given the diversity of eelgrass stressors in Puget Sound, the preferred approach is to pursue multiple strategies concurrently. Strategies are needed that explicitly address both protection and restoration. Examples of specific management actions that will contribute to achieving the target include enforcement of Hydraulic Project Code provisions that protect eelgrass, adding specific eelgrass protective measures to DNR leases through implementation of an Aquatic Lands Habitat Conservation Plan, and strengthening eelgrass protection in local Shoreline Master Plans. Supporting technical work should include habitat suitability modeling in concert with transplanting, and synthesizing available information on success of management actions from Puget Sound and other regions.

d. Scientific review: How has/can information be reviewed/vetted?

Much of the information reported here was drawn from a science report DNR prepared to support the target-setting process for eelgrass (Dowty et al. 2010). This report passed through an anonymous peer review process that was refereed by the chair of the Partnership's Science Panel, Tim Quinn. DNR provided a list of potential reviewers for that report and the same list could be considered for review of summaries provided in this document.